USAWC STRATEGY RESEARCH PROJECT

RESTRUCTURING TO ACHIEVE JOINT ENGINEER INTEGRATION AND TRANSFORMATION

by

LIEUTENANT COLONEL PAUL W. KELLY
United States Army

Colonel John F. Troxell
Project Advisor

U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
07 APR 2003		**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Restructuring to Achieve Joint Engineer Integration and Transformation	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
Paul Kelly;	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
U.S. Army War College,Carlisle Barracks,Carlisle,PA,17013-5050,	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
See attached file.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**		**34**	

ABSTRACT

AUTHOR: Lieutenant Colonel Paul W. Kelly

TITLE: Restructuring to Achieve Joint Engineer Integration and Transformation

FORMAT: Strategy Research Project

DATE: 07 April 2003 PAGES: 34 CLASSIFICATION: Unclassified

The service and joint engineer organizations that managed the military's engineer forces through the Cold War are no longer adequate to meet the new demands of the twenty-first century. Increased joint engineer operations, including new homeland defense support requirements, transformation of the joint force, and the growing need for efficient use of scarce engineer resources have created new demands on senior engineer leaders and their controlling organizations. These new realities drive the need for an engineer organizational structure that effectively orchestrates full spectrum, joint engineer integration in support of combatant commanders and that facilitates continuous joint engineer transformation.

This paper reviews the structure and mission of the US Army Engineer School (USAES), the Naval Construction forces Command (NCFC), the Air Force Civil Engineering Support Agency (AFCESA), and the joint engineer staffs of the Joint Staff, Joint Forces Command (JFCOM), and the geographic combatant commanders. It proposes a set of organizational changes that will improve the senior engineer leadership's ability to accomplish joint engineer integration and transformation. Recommendations include the creation of a Joint Engineer Integration and Transformation Office in JFCOM; more robust, separate combatant command engineer staffs directed by a general officer; and increased staffing in USAES, NCFC, and AFCESA.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

RESTRUCTURING TO ACHIEVE JOINT ENGINEER INTEGRATION AND TRANSFORMATION

The institutional organizations that managed the Armed Services engineering forces during the Cold War are the same basic ones in place today. Are they still the right structures for managing the military's engineering capabilities in today's very different world? So much has changed since the 1989 fall of the Berlin Wall for both the nation and the military. The United States has assumed many new duties and responsibilities as the world's sole superpower. Similarly, the military and its supporting engineer forces have seen a significant increase in global engagements. Joint operations in support of combatant commanders are now the primary means for accomplishing missions that span the range of military operations. Most recently, the war on terrorism and the need for a robust homeland defense have created new missions for the armed services. To keep up with these new realities, the nation's civilian and military leaders have changed the structure of the civilian and military organizations responsible for managing the armed forces. Examples include the establishment of the Department for Homeland Security, the re-alignment of the geographic combatant commands, the establishment of NORTHCOM and a new STRATCOM, the new missions given to JFCOM, and the establishment of the DOD Office of Force Transformation. These new structures facilitate the nation's leaders' ability to manage the new realities the country and the military face.

While the military's engineers face the same set of new realities, no such structural changes have occurred within the engineer community. Unfortunately, the existing organizational structures that manage the military's engineer forces are not designed to handle the new challenges. There are two key tasks the new challenges demand of the military's engineer leadership and of the organizations that support them. First, senior engineer leaders must have an organizational structure that effectively orchestrates full spectrum, joint engineer integration in support of combatant commanders anywhere in the world, including the United States. Second, senior engineer leaders need an organizational structure that facilitates continuous and effective joint engineer transformation. The engineer organizations that are responsible for managing today's engineer units and for developing tomorrow's engineer forces are not properly structured to accomplish these two critical requirements.

This paper reviews the key service and joint headquarters and staffs that should be responsible for managing the joint engineer integration and transformation processes. Specifically, it looks at the structure and missions of the service organizations responsible for organizing, equipping, manning, and training service engineers. These are the US Army

Engineer School (USAES), the Naval Construction Forces Command (NCFC), and the Air Force Civil Engineering Support Agency (AFCESA). The paper then reviews the structure and missions of key joint engineer staffs that support the CJCS, JFCOM commander, and the geographic combatant commanders. Collectively, these service and joint engineer organizations are the primary ones responsible for performing the two tasks of joint engineer integration and joint engineer transformation.

The paper proposes a set of organizational changes that will improve the service engineer leadership's ability to accomplish these tasks. It recommends the creation of a Joint Engineer Integration and Transformation Office to orchestrate joint engineer integration and transformation processes for the engineer community. It recommends making Combatant Command Engineer Staffs larger, more robust separate staffs directed by a flag officer and able to manage all engineering functions within that theater. Other recommendations include increasing the staff for the Joint Staff engineers and creating a Joint Integration and Transformation Cell in USAES, NCFC, and AFCESA.

NEW FORCES DRIVING NEW ORGANIZATIONAL STRUCTURES

The President, the SECDEF, and the CJCS have identified joint integration and transformation as critical processes that will keep the Armed Forces the best today while becoming the best into the future. They have structured controlling organizations to make these processes happen. The leadership doesn't know exactly where joint integration and transformation will take the military but they recognize that the 21st Century demands flexible, adaptive organizations that must work together and continuously improve on an ever-shortening cycle. This section reviews their actions and makes the case that the senior engineer leaders need to follow their lead. That is, the Engineer Service Chiefs need to recognize joint engineer integration and joint engineer transformation as critical processes for the Armed Service engineers and then structure existing organizations to be able to accomplish these critical functions.

In his National Security Strategy, the President of the United States calls for the transformation of America's national security institutions to meet the challenges and opportunities of the twenty-first century.[1] He has given the Defense Department "a broad mandate to challenge the status quo and envision a new architecture of American defense for decades to come."[2]

Secretary of Defense Rumsfeld has made "jointness" a top priority. In fact, his number two and three priorities are to strengthen joint warfighting capabilities and to transform the joint force, respectively. To achieve these priorities the SECDEF has set the following goals:

- Joint CONOPS to integrate air, land, sea, and ISR assets
- Translate Joint CONOPS into acquisition strategy
- Bring Jointness to the lowest level
- Strengthen joint exercise and joint training
- Lighter, more agile, easily deployable units
- A military culture that rewards innovation and risk-taking

Secretary Rumsfeld believes that achieving joint integration and joint transformation are requirements for achieving the objectives of the defense strategy.[3] Secretary Rumsfeld has also recognized that to transform the US Armed Forces to train and prepare for war the way it will fight – jointly – will require the transformation of the Defense Department that "serves them and prepares them for battle."[4]

The CJCS has also directed the Services to improve their joint warfighting capabilities. He sums up the importance of joint integration and transformation by stating that "just as improved joint warfighting capabilities are necessary to succeed against future enemies, so too is transformation of the force a necessity."[5] His staff developed *Joint Vision 2020* which states that to "build the most effective force for 2020 we must be fully joint: intellectually, operationally, organizationally, doctrinally, and technically.[6]

In order to achieve joint integration and joint transformation, these leaders have created structures or re-aligned existing ones. In November 2001, the SECDEF formed the Office of Force Transformation to assist him in "fostering innovation, monitoring joint experimentation, and for providing him with policy recommendations." He assigned retired Admiral Cebrowski to lead this organization.[7] The 2002 Unified Command Plan (UCP) shifted JFCOM's geographic area of responsibility to other Combatant Commands and tasked US Joint Forces Command (JFCOM) to focus almost exclusively on integrating and transforming US military forces for the 21st century. JFCOM now serves as the Armed Forces' lead as Joint Force Integrator, Joint Force Trainer, and Joint Force Provider. JFCOM has reorganized internally and become a central and influential player in moving the Armed Services toward jointness.[8] These organizations have taken the lead in moving the military toward increased joint integration and joint transformation. Examples of their initiatives include joint exercises like Millenium

Challenge 2002, the approved Standing Joint Task Force Headquarters, and funded programs like the Joint National Training Center, the Joint Tactical Radio System, and Deployable Joint Command and Control Systems.[9] The most senior defense leaders have identified joint integration and joint transformation as the processes that will determine the future military. They have created new organizations or re-structured existing ones to facilitate these critical processes.

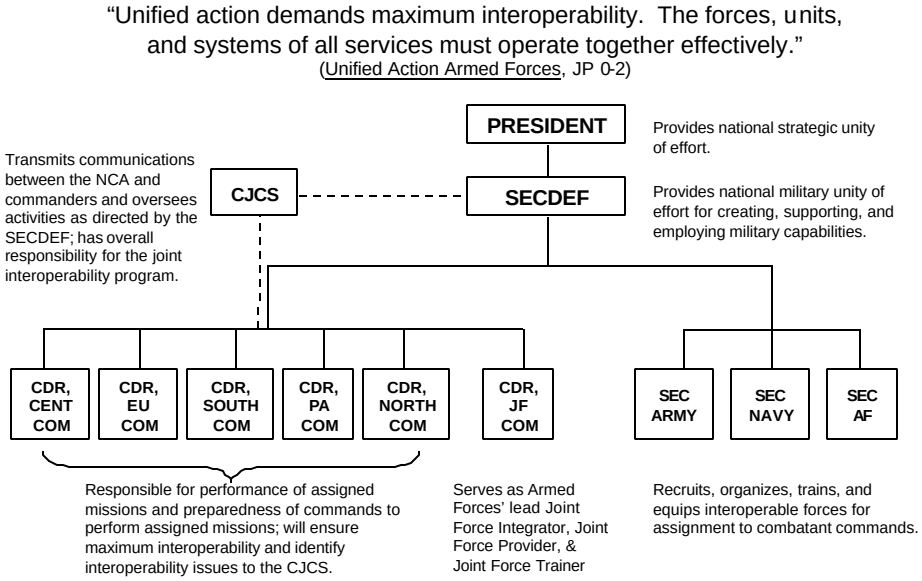

FIGURE 1. CHAIN OF COMMAND AND CONTROL

FORCES DRIVING JOINT ENGINEER INTEGRATION

Senior engineer leadership should follow this example set by the senior defense leaders. They should ensure that the engineer organizations that control the engineer forces can collectively perform two tasks: first, orchestrate effective joint engineer integration of full spectrum engineer missions in support of the combatant commanders and second, conduct effective joint engineer transformation. This section presents the rationale behind the selection of these two processes as critical to the success of military engineers.

The increasing number of joint engineer operations, the growing need for quick response engineering capabilities in a world of limited engineer resources, and the demonstrated need for improved engineer interoperability all drive the need for effective joint engineer integration as an

essential capability of the organizations that manage the military engineers. During the Cold War, the number of joint engineer operations was relatively small. Service engineers tended to operate in support of their service forces and provide support to other services on a task basis.[10] Since 1990, this has changed. There has been a sharp increase in the number of military operations involving significant joint engineer operations. Joint operations like OPERATION PROVIDE COMFORT in Northern Iraq, RESTORE HOPE and UNOSOM II in Somalia, UPHOLD DEMOCRACY and SEA SIGNAL in Haiti, FUERTE APOYO in Central America, JOINT ENDEAVOR and JOINT FORGE in Bosnia, and NOBLE ANVIL in Kosovo all required joint engineering support. These operations were characterized by joint engineer planning, joint engineer command and control, joint engineer operations, and joint engineer support to all services.[11] This increasing trend of joint engineer operations shows no signs of slowing down.

In fact, the range of military operations that the engineers must support has increased significantly with the addition of the War on Terrorism and the need for Homeland Defense. One recent study of engineer support to Homeland security concluded that regionally based engineer "Response Task Forces" (RTF) were the optimum way to meet the engineering requirements. It also concluded that these RTFs "must be joint and multi-component" in order to have sufficient engineer assets to cover the entire country.[12] Engineers must be able to quickly and effectively integrate their forces and capabilities to successfully support this full spectrum of operations. As requirements for engineers increase but the size of the engineer force remains static, effective and efficient application of all military engineer assets will become essential. To support this need for improved joint engineer integration, the engineers require an organizational structure that can coordinate and integrate the service engineer capabilities in a resource constrained and high operational tempo environment.

The record for effectiveness and efficiency of joint engineer operations shows there is room for improvement. While the ad-hoc, joint engineer organizations on the ground have always figured out a way to accomplish their engineer missions, lessons learned point to significant deficiencies in achieving effective joint engineer integration. Three separate studies into recent joint engineer operations concluded that significant improvement in joint engineer integration is needed. The studies pointed to a lack of sufficient joint engineer staff to support effective planning and supervision for the Combatant Commander, ineffective joint engineer command and control, and a lack of interoperability among service engineers.[13]

Organizational deficiencies of the Combatant Commander's engineer staff were a common deficiency. One study cited the lack of General Officer-level joint engineer headquarters and staffs of insufficient size and expertise to conduct early planning as reasons

for a “lack of engineer planning on the CINC’s staff.”[14] Another study of four recent joint engineer operations cited the challenges of planning joint engineer operations due to the different joint engineer staff structures currently found at the unified staff level.[15] Senior engineer leaders need organizations that will address the new realities of increased joint engineer operations, scarce resources, and identified shortcomings and that will then develop approaches and solutions to ensure the effective joint engineer integration of today’s engineer forces.

FORCES DRIVING JOINT ENGINEER TRANSFORMATION

Effective joint engineer transformation is required as an essential process for successful future military engineers for two primary reasons. First, as a supporting force, engineers need to be integrally involved in the ongoing joint force transformation process to ensure they are transformed as part of the overall joint force. Second, there are many opportunities in joint engineer transformation to significantly improve overall engineer capabilities in support of the joint force.

The 2002 Unified Command Plan assigns JFCOM the responsibility for leading joint force transformation. Determining how to support JFCOM and its spiral development transformation process will require well coordinated support from the service engineers. Joint engineers must be fully engaged in the joint experimentation process being controlled by JFCOM to have a voice in how the new operational concepts and supporting technologies will be developed, tested, and exercised. This requires an organizational structure tied into JFCOM and its experimentation and transformation processes.

Real improvements in efficiency and effectiveness of joint engineer capabilities could result from joint engineer transformation of engineer materiel, training, doctrine, and leader development. One area with tremendous potential for improved engineer capabilities is the development of “born joint”, interoperable engineer equipment and materials. Currently, each of the service engineers work within their own service structures to develop, acquire, and maintain engineer equipment and materials.

This means that interoperable and common engineer items are not the norm among the service engineers. One result is that service engineer units cannot exchange equipment. For example, Navy Seabees in Afghanistan flew in equipment they required, then flew it all out when Marine forces they were supporting were relieved by Army forces, whose engineers flew in all their own equipment.[16] Another negative consequence is that service engineers cannot exchange repair parts or even provide maintenance support to equipment from other services.[17]

Reducing the need for separate equipment and spare parts through joint engineer transformation will also significantly reduce the engineers logistic footprint – a major goal for the joint force.[18]

Common engineer equipment also affects joint engineer training. Many construction military occupational specialties (MOS) from the Army, Navy, Air Force, and Marines currently train at the same facilities during Advanced Individual Training (AIT). Locations include Fort Leonard Wood, Missouri, Sheppard AFB, Texas, Gulfport, Mississippi, and Fort Belvoir, Virginia.[19] While there are some items of construction equipment that allow soldiers, sailors, airmen, and marines to train jointly at the same site (scraper, grader), there are just as many service-unique items of equipment that force the different service members to train separately at different sites on the same installation (different types of rollers, dozers, cranes).[20] Having common equipment for common service engineer functions such as construction would facilitate common individual engineer training. It would also improve operator interoperability during joint operations. Engineer operators from any service could fall in on any service engineer equipment and effectively operate the equipment.

The service engineers have produced several joint engineering publications outlining joint engineer doctrine that is current and useful. This area may be the most integrated of the doctrine, organization, training, materiel, leadership, personnel and facilities (DOTMLPF) areas. Listed below are the major engineering joint publications. These publications provide a ready resource for military engineers who will operate in a joint engineering environment. They provide a baseline for how engineers of the different services must work together in various types of joint operations.

- JP 3-34, Joint Doctrine for Engineer Operations
- JP 4-04, Joint Doctrine for Civil Engineering Support
- JP 2-03, Joint Tactics, Techniques, and Procedures for Geospatial Information and Services Support to Joint Operations
- JP 3-15, Joint Doctrine for Barriers, Obstacles, and Mine Warfare

However, a close review of these joint publications shows that in many instances they are a “stitching together” of the individual Service engineer capabilities and doctrine. The next level of jointness will flow from a common joint engineer vision and common joint engineer concepts of operation. Some of this joint engineer vision must wait for a clearer picture of overall joint force concepts of operation. Some, particularly in the construction area, could be developed

now. There needs to be some organization in place to develop this joint engineer vision and joint engineer concepts of operation.

There are not any joint engineer schools or joint engineer education programs at this time. Currently, officers assigned to JTF engineer staffs are often not properly versed in joint engineer operations. JTF engineer staffs are comprised of several 0-4 through 0-6 officers who may or may not have been exposed to joint Professional Military Education (PME).[21] Very few of the 0-3s in these joint engineer organizations have had joint training or education. Additionally, joint PME has little or no engineer content. Therefore, most officers assigned to JTF engineer staffs have little or no understanding of engineer capabilities outside of their own Service. This creates a sharp learning curve before they are able to function effectively in a joint engineer environment.[22] Joint engineer transformation would address joint engineer leader development and education and determine solutions to improve the current deficiencies and increase joint engineer leader capabilities.

Joint engineer integration and joint engineer transformation are two new processes required by the military's engineer leadership to keep engineers relevant and productive today and tomorrow. Joint engineer integration will improve joint engineer capabilities in a time of increasing joint engineer operations and stable engineer resources. Joint engineer transformation promises many improvements to future engineer capabilities as well as ensuring the engineer community stays in step with the transforming joint force it supports.

SERVICE ENGINEER ORGANIZATIONS RESPONSIBLE FOR ORGANIZING, EQUIPPING, MANNING, AND TRAINING ENGINEER FORCES

Senior engineer leaders must have an organizational structure that effectively orchestrates full spectrum, joint engineer integration in support of combatant commanders anywhere in the world. Senior engineer leaders also need an organizational structure that facilitates effective joint engineer transformation. The engineer organizations that are responsible for managing today's engineer units and for developing tomorrow's engineer forces are not properly structured to accomplish these two critical requirements. This section reviews the key service and joint headquarters and staffs responsible for managing the military's engineering forces. It first reviews the structure and missions of the service organizations responsible for organizing, equipping, manning, and training service engineers. This section then looks at the structure and missions of key joint engineer staffs that support the CJCS, the JFCOM commander, and the geographic combatant commanders. Collectively, these service and joint engineer organizations are the primary ones responsible for performing the two tasks of joint engineer integration and joint engineer transformation.

There are two categories of engineering support that drive the current engineer organizational structure responsible for managing the engineers of the Army, Navy, and Air Force. These two very different categories of engineering support cause each service to maintain two separate and distinct engineer organizations. The first category is engineering support to military operations. The engineer forces that traditionally fall in this category are deployable military engineer units responsible for combat engineering, general engineering, and topographic engineering. These forces are managed by the service engineer organizations responsible for organizing, equipping, manning, and training their service engineers. These organizations are the US Army Engineer School (USAES), the Naval Construction Forces Command (NCFC), and the Air Force Civil Engineer Support Agency's Contingency Support Directorate (AFCESA CEX). USAES, NCFC, and CEX play a large role in their service engineer transformation processes. They have a minimal role in the joint engineer integration process.

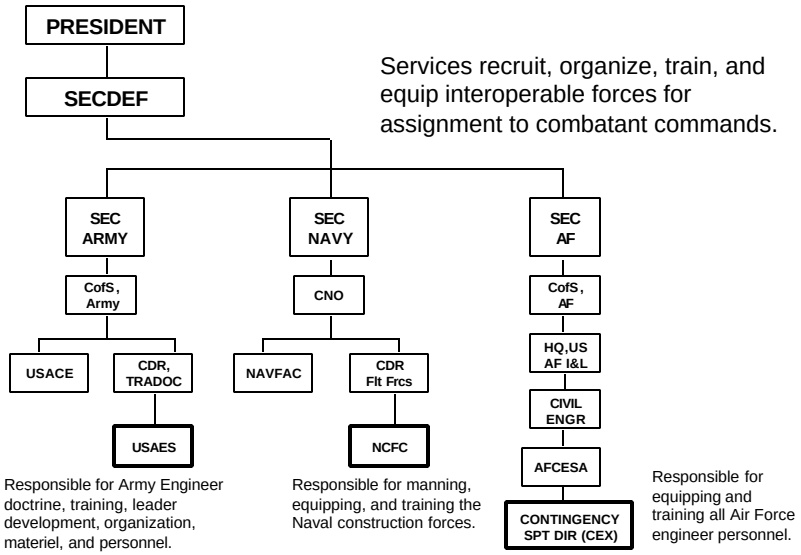

FIGURE 2. CURRENT SERVICE ENGINEER ORGANIZATIONS

The second category is engineering support to the national and military infrastructure. The engineer "forces" under this category are primarily non-deployable, civilian engineer organizations focused on civil works, environmental issues, engineering research and

development and permanent base infrastructure and construction. These forces are managed by engineer headquarters commanded by military engineer officers. These organizations are the US Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), and AFCESA's Technical Support Directorate (CES). While these organizations provide some support to military engineer units and the combatant commanders, this is not their primary mission. As organizations, USACE, NAVFAC, and AFCESA play secondary roles in joint engineer integration and joint engineer transformation. Therefore, they will not be examined as part of this paper.

US ARMY ENGINEER SCHOOL

The US Army Engineer School (USAES), part of the Army Training and Doctrine Command (TRADOC), is responsible for the Army engineer doctrine, training, leader development, organization, materiel, and personnel.[23] USAES is responsible for the functions involved in joint engineer integration and transformation. USAES develops the engineer doctrine, organizations, training, materiel, leadership, personnel, and facilities (DOTMLPF) for the existing legacy forces, the interim Brigade Combat Team, and the Objective Force (as part of the ongoing Army Transformation process). While the USAES team considers joint engineer operations in general terms as it transforms itself within the Army Transformation process, USAES has not yet actively integrated the other Services in developing the Objective Force engineer DOTMLPF. Insufficient time, lack of manpower, and a lack of an overall joint engineer transformation process are all valid reasons why USAES has been unable to use the Army Transformation process to further joint engineer force transformation.

NAVAL CONSTRUCTION FORCES COMMAND

On 1 August 2002, NAVFAC activated the Naval Construction Forces Command (NCFC) to manage the Naval Construction Force assets and focus on improving war-fighting readiness.[24] This structural change strongly supported joint engineer integration in support of combatant commanders. This new Naval command is the "single command interface with Commander Fleet Forces Command to develop, coordinate, and implement policy and requirements to man, equip, and train" the naval construction forces.[25] The NCFC will provide combat construction forces to fulfill operational and forward engagement requirements of a combatant or component commander and contingency and deliberate planning in support of OPLANs.[26] This reorganization recognized that NCFC will execute operations "covering the full spectrum of engineering and construction tasks through task tailored units deployed around the

world within the full spectrum of threat environments."[27] Finally, this reorganization acknowledges that "a substantial percentage of operations will be prosecuted in joint/combined scenarios."[28] This restructuring addressed the need for engineer integration in support of combatant commanders and it demonstrated awareness of the need for joint engineer integration. Unfortunately, like USAES, the NCFC is not currently involved in joint engineer transformation, other than internally with the US Marine Corps.[29]

US AIR FORCE CIVIL ENGINEER SUPPORT AGENCY'S CONTINGENCY SUPPORT DIRECTORATE

USAFCESA's Contingency Support Directorate (CEX) is charged with ensuring all engineer personnel are trained and equipped to deploy anywhere in the world in case of war or peacetime emergencies.[30] These forces include active duty, Air National Guard, and Air Force Reserve Command mobility forces. The directorate works with war planners from the Air Force and other services to ensure engineer forces are accurately reflected in U.S. war plans. An integral part of the directorate is the Civil Engineer Readiness Operations Center which coordinates engineer support activities worldwide. The directorate's four divisions represent its major areas of responsibility--explosive ordnance disposal, fire protection, Full Spectrum Threat Response, and Expeditionary Engineering.[31] This Contingency Support Directorate is analogous to the Army's USAES and the Navy's NCFC. Unlike the Army and Navy, the two categories of engineer support (military and national/military infrastructure) fall under a single command in the Air Force. This is primarily because the Air Force does not have a base construction mission. USACE manages the construction of permanent Air Force facilities.[32]

JOINT ENGINEER ORGANIZATIONS INVOLVED IN JOINT ENGINEER INTEGRATION AND TRANSFORMATION

There is no single DOD or joint engineering organization that commands, supervises, or even coordinates the engineers of the different services. The primary joint engineer organizations involved in integrating engineer forces in support of the combatant commanders are actually subordinate engineer staffs in the Joint Staff, JFCOM, and the geographic Combatant Commands. Each of these organizations has their own unique engineer staff and mission focus. The sections below provide a brief description of these joint engineer organizations.

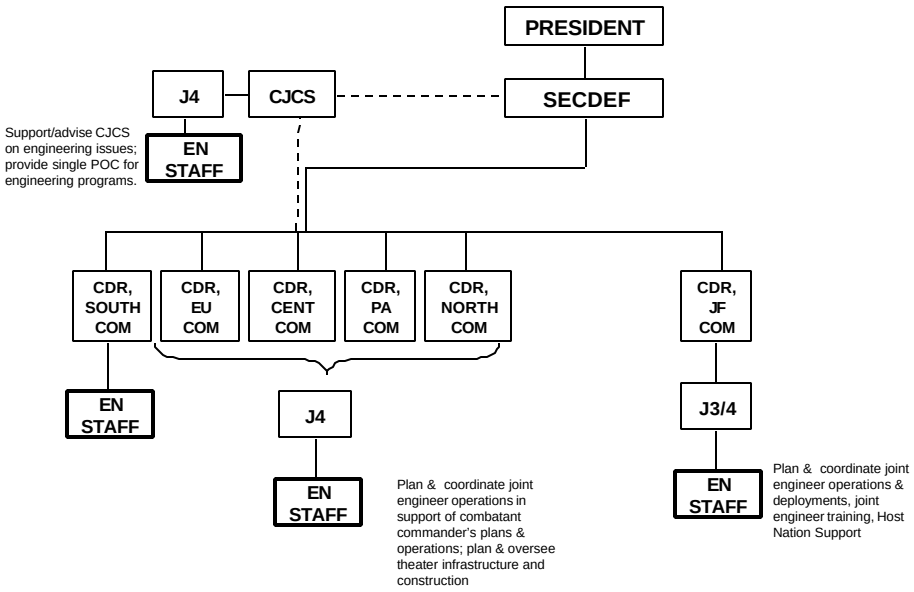

FIGURE 3. CURRENT JOINT ENGINEER STAFFS

JOINT STAFF ENGINEER

At the Joint Staff, the joint engineer staff resides in the Engineering Division of the Directorate for Logistics (J4). Its mission is to--

> Support the Chairman with up-to-date information on international logistics and engineering issues involving CINCs, Services, DOD agencies, and others as required. Support the CINCs by providing joint policy guidance and support on engineering issues/programs. Provide a single point of contact on the Joint Staff for CINCs, Services, and agencies to facilitate international logistics and engineering support and initiatives. Serve as the civil engineering support concept developer and enabler for Focused Logistics.[33]

This important joint engineer staff is run by a Navy 06 with a staff of 4 personnel – two Army O5s, one Air Force O5, and a Navy O5. This staff is one deep and organizes by geographic combatant commands and by functional areas.[34] The staff's current role in joint engineer integration and transformation is limited. Interestingly, this staff commissioned a fairly comprehensive Engineer Capabilities Study that concluded the Joint Staff engineer should play a larger role in these processes.[35] However, given their current staffing and the macro-level of

their mission focus, this staff is not prepared to take on the leadership or any major role in joint engineer integration or joint engineer transformation.

JFCOM ENGINEER

At JFCOM, the engineer staff is found in the J3/4. This staff organizes around the following functions: joint engineer operations (readiness and force provider), joint engineer training and plans, Host Nation Support, and environmental assessment.[36] The JFCOM J3/4 Engineering Division has a total of 6 authorized positions organized along the roles described above. The division chief is a civilian and his staff consists of an Army O5, a Navy O5, an Air Force O4, and two additional civilians.[37] Like the Joint Staff engineers, JFCOM's engineers cover a wide breadth of engineering responsibilities with a limited staff. Also like the Joint Staff engineers, they are not heavily involved in joint engineer integration and transformation. One reason is that the JFCOM staff engineers do not have anyone dedicated to working the J9 Joint Concept, Development, and Experimentation issues. They have recently received authority to hire an individual to work J9 engineer issues - this will help.[38] Another factor limiting the JFCOM engineer staff's role in joint engineer integration and transformation is that the JFCOM staff is limited to working on those joint transformation capstone concepts approved by the JROC. The nine currently approved capstone concepts do not lend themselves to joint engineer issues.[39] The JFCOM engineer staff's focus on integration and transformation is growing as JFCOM's role in Joint Warfighting Experimentation and Transformation grows. The engineer staff plans to focus more time on joint future lab efforts to ensure engineer perspectives are being addressed.[40] Additionally, they have recommended a Joint Engineer conference for Service and joint engineer communities to address engineer goals and concerns and to establish common objectives where appropriate.[41] While the JFCOM engineer staff needs to play an important and growing role in joint engineer integration and transformation, their position in J3/4, the division chief's rank, and their small staff prevent this engineer staff from dedicating significant time and effort to these functions.

COMBATANT COMMAND ENGINEERS

Each geographical Combatant Command organizes their engineer staffs differently. The Combatant Command engineer staff elements are all located in the J4 except for in SOUTHCOM. There, the engineer staff is a separate special staff to the Combatant Commander. The most senior of the combatant command engineer staff officers is an 06. During peace time, the staffs are small. For example, the CENTCOM Engineer Division staff

consists of only 13 total personnel during peacetime.[42] These joint engineer staff elements focus on planning and organizing the engineer support for the Combatant Commander. They use existing doctrine, equipment, organizations, and planning factors to develop and engineer plan to support combatant commander's operations. The combatant command engineer staffs rarely execute the joint engineer operations. These engineer staffs flow in engineer command and control headquarters to execute the joint engineer plans they develop. Combatant command engineer staffs must be expert across the full range of operations and must consider the following during planning to be able to properly integrate joint engineers: geospatial information, intelligence requirements, topographic engineer support, construction support, countermine operations, force protection, Host Nation forces, multinational operations, interagency operations, contractor support, materiel acquisition, operational phases, environmental considerations, and funding and resource management.[43]

CONCLUSIONS ABOUT CURRENT ENGINEER ORGANIZATIONS' ABILITY TO CONDUCT JOINT ENGINEER TRANSFORMATION

Currently, USAES, NCFC, and USACESA's Contingency Support Directorate exist and operate independently of each other. Each of these organizations relies on its own service DOTMLPF systems and processes. Each is pursuing its own internal transformation process without coordination with the other service engineer organizations. There is no existing joint engineer organization or system to coordinate or synchronize the transformation processes of these separate Service engineer organizations.

The Joint Staff Engineer staff ought to be involved in pulling together joint engineer transformation.[44] However, the reality is that this staff's heavy workload, staff of five, O-6 level chief, and location in the Joint Staff J4 prevent it from taking any significant role in joint engineer transformation. The JFCOM Engineer staff is an even more logical choice for leading joint engineer transformation. Since JFCOM is the lead in joint force experimentation and joint force integration, it makes sense that the JFCOM Engineer staff should be the focal point for these same tasks for the engineer community. Unfortunately, their heavy workload, staff of six, O-6 level chief, and location in the J3/4 also prevent this staff from taking charge of joint engineer transformation.

Two quotes sum up this fairly bleak situation: "Today, there is no focal point to identify common engineer issues and potential solutions and present them to decision-makers. Engineer issues are disaggregated throughout individual Service Programs and do not benefit from the advantage of common solutions to common problems,"[45] and "there is also no common

engineer voice in joint experimentation, no 'point of leverage' for engineers to influence joint experimentation."[46] Without an effective organizational structure to drive joint engineer transformation, there is minimal work being done to integrate or develop joint engineer organizations, training, materiel, leader development, personnel, or facilities. Senior engineer leaders must establish a supporting organizational structure to make joint engineer transformation a reality.

CONCLUSIONS ABOUT CURRENT ENGINEER ORGANIZATIONS ABILITY TO CONDUCT JOINT ENGINEER INTEGRATION

This review of joint engineer organizations shows that they are inadequately staffed and improperly positioned within their larger organizational structures to effectively orchestrate full spectrum, joint engineer integration in support of combatant commanders. The Combatant Commanders' engineer staffs cannot properly address all engineer planning considerations from their position in the J4. This small staff is insufficient to coordinate across all the staffs due to the breadth of their planning requirements. The combatant commander engineer staffs need a more robust planning team in peacetime to properly address the full scope of engineering required in support of full spectrum operations so the plans are prepared when a crisis occurs. Additionally, the peace time engineer staff needs to be large enough to handle the crisis action planning to include initial supervision of engineer forces until the engineer command and control headquarters arrives in theater. The lack of a general officer also hinders the full hearing of engineer issues during the planning and integration process. As currently structured and staffed, the combatant command engineer staffs are not as prepared as they need to be to conduct effective joint engineer integration of engineer forces in support of combatant commanders' operations.

As JFCOM's role in joint force integration grows, so must the JFCOM engineer staff's role in joint engineer force integration increase. JFCOM is now the Armed Forces' lead joint force integrator and force provider. The JFCOM engineer needs to be the lead joint engineer force integrator and joint engineer force provider. The JFCOM J3/4 Engineering Division needs a more robust staff to support this growing requirement. JFCOM's engineer staff of six led by an O-6 is insufficient for its role as the engineer force provider. These structural deficiencies must be fixed to achieve effective full spectrum joint engineer integration in support of the combatant commanders.

Not only are the joint engineer staffs inadequately staffed and improperly positioned but there is no organization or process to integrate the efforts of the entire Combatant Command/service engineer community although meeting the above challenges clearly requires

an integrated effort.[47] This is primarily because no engineer organization or staff has been given the joint force integration mission along with the resources to make it happen. To be successful in conducting joint engineer force integration and transformation, the engineer community must address these structural and organizational deficiencies.

RECOMMENDATIONS

The Armed Forces faced a crossroads as they moved into the 21st Century. The senior defense leaders chose joint integration and joint transformation as the path to the future of the military. Senior engineer leaders have the opportunity to take the same road, in step with the Armed Forces they support. Taking this path has the potential to significantly improve the overall capabilities of engineers to support the military and the nation. The following three imperatives spell out how senior engineer leaders can put engineers on the path to achieving joint engineer force integration and transformation. First, Service Chief Engineers must radically commit to joint engineer integration and transformation as the right course for the engineer community. Second, Service Chief Engineers must structure the engineer organizations that manage engineer forces to be able to conduct these two processes. Finally, Service Chief Engineers must endorse and support the procedures developed by this new structure for accomplishing joint engineer integration and transformation – even at the risk of "losing" traditional Service capabilities. Below is one way to carry out these imperatives.

FIRST IMPERATIVE

The Service Chief Engineers must radically commit to joint engineer integration and transformation as the right approach. The Service Chief Engineers currently own the funding, the manpower, and the processes that will make integration and transformation happen.

> Developing a joint engineer community 'united front' and an integrated approach to joint engineer transformation will require creation of a 'critical mass' of support from engineer GO/FOs. This is probably the only way to achieve the required consensus about engineer-related transformation issues and to give them the required level of visibility and support within DOD, the Joint Staff, and the Services.[48]

The Service Chief Engineers are the key decision makers that will make or break joint engineer integration and transformation. They possess the power and influence to make these processes happen or not. It will most likely take a joint effort from all the Service Chief Engineers. Getting these senior leaders to buy into joint engineer integration and

transformation will be challenging. As one comprehensive study cited, "The scope of the required joint engineer transformation effort is significant, and no one should underestimate the difficulty involved. Individually, each Service engineer community lacks the influence and resources to manage change of this magnitude. But collectively, for a joint engineer community, none of this is insurmountable."[49]

Initially, it would require the initiative of at least one of the Service Engineer Chiefs to commit to joint engineer integration and transformation. Once committed, this Chief could create the required sense of urgency among the other Service Engineer Chiefs needed to initiate joint engineer force integration and transformation. The chiefs would then build a guiding coalition to lead the changes necessary. This team would logically consist of the Service Engineer Chiefs, USAES Commander, NCF Commander, AFCESA Director, the Joint Staff Engineer, the JFCOM Engineer, and the geographic Combatant Command Engineers.

SECOND IMPERATIVE

Next, Service Chief Engineers must structure the engineer organizations that manage engineer forces to be able to conduct joint engineer integration and joint engineer transformation. One way to accomplish this is to make the following three structural changes:

- Establish a Joint Engineer Integration and Transformation Office and locate it in JFCOM; incorporate the current JFCOM engineer staff into this office
- Provide each geographic combatant commander with a one-stop shopping joint engineer staff for all engineering planning and operations requirements; put a General or Flag officer in charge of this more robust staff and make it a separate staff
- Increase the size of Joint Staff engineer staff
- Create a joint engineer integration and transformation cell within USAES, NCFC, and AFCESA

The first step would be to create a Joint Engineer Integration and Transformation Office. Locate this organization as a separate directorate of JFCOM. Assign flag officers from USACE and NAVFAC as director and deputy director. Put an AFCESA one-star or 06 in a key position. Incorporate the existing JFCOM staff into this organization and assume their current responsibilities. Fully participate in the JFCOM J9 experimentation processes and represent all joint engineer concerns and issues. Enhance the staff with joint, functional teams organized around the key engineering functions of general engineering, combat engineering, and topographic engineering. Task the office to develop a *Joint Engineer Vision* and a *Joint*

Engineer Vision Implementation Plan. Task the office to further assess the current structures and processes in place for conducting joint engineer integration and transformation and recommend further changes as required. Task the office with the continuing mission to orchestrate joint engineer integration and transformation for the service engineers. The DOTMLPF engineer organizations (USAES, NCFC, AFCESA Contingency Support Directorate) would remain in their Service structure but would be tied closely into the joint engineer force integration and transformation processes.

The second change would be to enhance the existing joint engineer staffs belonging to the Combatant Commanders. Make engineer staffs for Combatant Commanders the single source for all engineering functions within that Combatant Commander's AOR. Put a flag or general officer in charge of the joint engineer staff. Move the engineer staffs from under the J4 and make it a special staff to the commander. Make the joint engineer staff robust enough to handle all engineer planning and supervision for full spectrum operations. Include on the staff the capability to participate in joint engineer integration and transformation processes.

The third organizational change would be to increase the size of the Joint Staff engineer staff to be able to participate in the joint engineer integration and transformation processes and to represent all joint engineer concerns to the CJCS and the Joint Staff. Finally, create a small cell focused on joint engineer integration and transformation processes within USAES, NCFC, and AFCESA. As these processes become a normal way of doing business, these service engineer cells would become key players within the service engineer community for integrating and transforming engineers within the joint engineer community.

THIRD IMPERATIVE

The third imperative is that these new or re-structured organizations would need the authority to develop processes that would force the Service Engineer Chiefs to make the hard decisions on joint engineer force integration and transformation - for the good of the Armed Forces and the Nation. This would mean a system similar to the *Joint Vision* Implementation. The Joint Requirements Oversight Council (JROC) and the Joint Warfighting Capabilities Assessment (JWCA) teams provide examples of ways to organize and set up processes to force the decision makers to address the tough issues that naturally flow from joint force integration and transformation. The Service Engineer Chiefs, the Joint Staff Engineer, the JFCOM Engineer, and the geographic Combatant Command Engineers would all participate in processes similar to those spelled out for the JROC and JWAC. The Joint Engineer Integration and Transformation Office would be responsible for developing these systems and processes.

This new Office would spell out the relationships between all the joint and Service engineer organizations involved in joint engineer force integration and transformation. This would require opening new lines of communication and or setting up processes to orchestrate DOTMLPF integration and transformation at this level. For example, these processes would address relationships and communications among USAES, NCFC, AFCESA's Contingency Directorate, and the new or enhanced joint engineer staffs and organizations. The success of these processes and relationships would depend largely on the willingness of the Engineer Service Chiefs to support this new way of doing business.

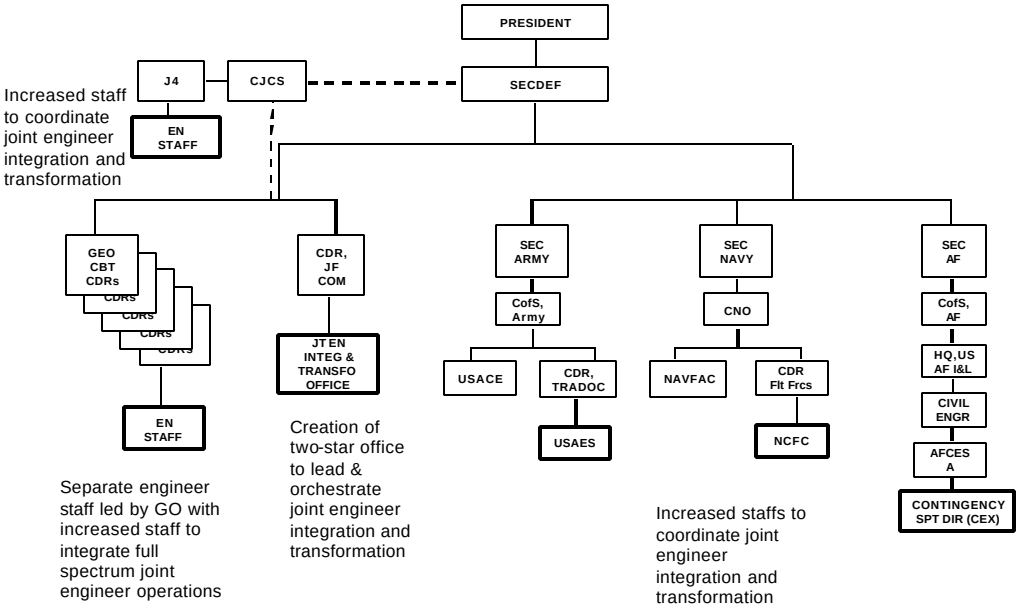

FIGURE 4. RECOMMENDED RESTRUCTURING FOR JOINT ENGINEER INTEGRATION AND TRANSFORMATION

CONCLUSION

The engineer organizational structures in place today that manage the engineer forces are inadequate for handling the new realities of the 21st Century. Making the organizational changes proposed in this paper will facilitate joint engineer force integration and transformation but will require significant manpower and tremendous effort. The obstacles are significant. However, maintaining the status quo in the face of the new realities of the twenty-first century

will most likely result in two unacceptable consequences: the engineer community not fully represented in the decisions being made about the current and future joint force and a less capable, less relevant engineer force. The Service Chief Engineers are the key decision makers who must lead the military engineers to support the joint force of today and tomorrow. These leaders must join together to restructure the current engineer organizations that manage the military's engineer forces. By creating new or enhanced organizations dedicated to joint engineer force integration and transformation, the Service Engineer Chiefs can put the engineers on a path to become an engineer force capable of supporting the Armed Forces and Nation in the 21st Century.

WORD COUNT = 6,691

ENDNOTES

[1] George W. Bush, The National Security Strategy of the United States of America (Washington, D.C.: The White House, September 2002), 2.

[2] Paul Wolfowitz, "Prepared Statement For the House Budget committee on the FY 2004 Defense Budget Request," 27 February 2003; available from <http://www.defenselink.mil/speeches/2003/sp20030227-depsecdef0044.html>; Internet; accessed 18 March 2003.

[3] Department of Defense, Quadrennial Defense Review Report (Washington D.C.: U.S. Department of Defense, 30 September 2001), 29.

[4] Donald H. Rumsfeld, "FY 2004 Defense Budget Testimony (As Prepared)", 5 February 2003; available from <http://www.defenselink.mil/speeches/2003/sp20030205-0005.html>; Internet; accessed 18 March 2003.

[5]Richard B. Myers, "Posture Statement Before the Senate Armed Services Committee, 5 February 2002," 5 February 2002; available from <http:www.senate.gov/~armed_services/statement/2002/Myers.pdf>; Internet; accessed 16 June 2002.

[6] Joint Staff, JV 2020 (Washington, D.C.: US Government Printing Office, June 2000), 2.

[7]Colin Robinson, "Fact Sheet: DoD Office of Force Transformation," 14 June 2002; available from <http://www.cdi.org/mrp/oft.cfm>; Internet; accessed 25 February 2003.

[8]Unified Command Plan (Washington, D.C.: The White House, 30 April 2002), 7-10.

[9]Rumsfeld, 7.

[10] Roger A. Gerber, Joint Engineer Support to the Warfighting CINCs, Strategy Research Project (Carlisle Barracks: U.S. Army War College, 10 April 2000), 8.

[11]Four separate sources discuss these joint operations:

Roger A. Gerber, Joint Engineer Support to the Warfighting CINCs, Strategy Research Project (Carlisle Barracks: U.S. Army War College, 10 April 2000)

Timothy A. Byers, Joint Engineers: Full Spectrum Support-From Peace to War, Strategy Research Project (Carlisle Barracks: U.S. Army War College, 7 April 1999)

Joint Chiefs of Staff, Engineer Doctrine for Joint Operations, Joint Publication 3-34 (Washington, D.C.: U.S. Joint Chiefs of Staff, 5 July 2000)

Anthony Vesay, "Joint Engineer Training: Top Ten Lessons Learned," Engineer 29 (April 1999): 17 [database on-line]; available from ProQuest; accessed 22 October 2002.

[12] Michael S. Flanagan, The Role of the Corps of Engineers in Homeland Security, Strategy Research Project (Carlisle Barracks: U.S. Army War College, 9 April 2002), 22.

[13] Gerber, Byers, and Vesay.

[14] Gerber, iii.

[15] Byers, 24-27.

[16] Science Applications International Corporation, Engineer Capabilities Study: A Path to the Future (Final Report), (McLean, Virginia, 30 September 2002), 18.

[17] Ibid.

[18] Joint Staff, 24-25.

[19] Naval Construction Training Center, "ITRO History," available from <http://wwwnt.cnet.navy.mil/nctcph/itrohistory.htm>. Internet; accessed 18 March 2003.

[20] From personal observation while assigned to Fort Leonard Wood, Missouri from 1998 to 2000.

[21] Science Applications International Corporation, 54.

[22] Ibid.

[23] Army Engineer School, "U.S. Army Engineer School Strategic Plan (FY01)," available from <http://wood.army.mil/eschool/Strawman%20for%20FY01%20USAES 2.htm>; Internet; accessed 24 November 2002.

[24] Bill Grip <gripwg@ncf.navy.mil> , "Can You Help Me Answer This," electronic mail message to Jeff Lamberson <Lambson@alol.com> , 21 February 2003.

[25] Department of the Navy, Establishment of First Naval Construction Division(1NCD)/Naval Construction Forces Command (NCFC) and Modification of Atlantic and Pacific Naval Construction forces (NCF), OPNAVNOTE 3111 (Washington, D.C.: U.S. Department of the Navy, 26 July 2002), 1.

[26] Ibid., 6.

[27] Ibid., 6.

[28] Ibid, 6.

[29] Grip.

[30] Air Force Civil Support Agency, "Fact Sheet: Air Force Civil Support Agency," February, 2003; available from <http://www.af.mil/news/factsheets/ Air force Civil Engineer.html> ; Internet; accessed 18 March 2003.

[31] Ibid.

[32] Department of the Army, Engineer Operations Short of War, Field Manual 5-114, (Washington, D.C.: U.S. Department of the Army, 13 July 1992), D-7.

[33] J4 Joint Staff Logistics Directorate, "Engineering Division," available from <http://www.dtic.mil/jcs/j4/organization/ed/ed.htm>. Internet; accessed 22 October 2002.

[34] Irvin Lee, staff officer in Joint Staff J4 Engineering Division, telephone interview by the author, 21 February 2003.

[35] Science Applications International Corporation, 6.

[36] John Woodward, staff officer in JFCOM J4 Engineering Division, telephone interview by the author, 21 February 2003.

[37] Ibid.

[38] Ibid.

[39] Ibid.

[40] Science Applications International Corporation, Annex A, Appendix 5, 3.

[41] Ibid., 4.

[42] Robert Carpenter, former CENTCOM engineer staff officer, telephone interview by the author, 3 April 2003.

[43] Joint Publication 3-34, III-8.

[44] Science Applications International Corporation, 63.

[45] Ibid., 61.

[46] Ibid., 61.

[47] Ibid, 60.

[48] Ibid, 61.

[49] Ibid, 5.

BIBLIOGRAPHY

Aadland, Anders B. "Engineer White Paper – Into the Objective Force." Engineer 32 (April 2002): 4-10.

Carpenter, Robert, former CENTCOM engineer staff officer. Telephone interview by the author, 3 April 2003.

Davis, Paul K. "Transforming the Armed Force: An Agenda for Change." In The Global Century: Globalization and National Security. Washington, D.C.: National Defense University Press, 2001, p. 423-442.

Dunn, Richard J. III. "Transformation: Let's Get It Right This Time." Parameters. Carlisle Barracks, Spring 2001.

Grip, Bill <gripwg@ncf.navy.mil>. "Can You Help Me Answer This." Electronic mail message to Jeff Lamberson<lambson@aol.com> , 21 February 2003.

J4 Joint Staff Logistics Directorate. "Engineering Division." Available from <http://www.dtic.mil/jcs/j4/organization/ed/ed.htm>. Internet. Accessed 22 October 2002.

Jablonsky, David. "Army Transformation: A Tale of Two Doctrines." Parameters. Carlisle Barracks, Autumn 2001. Database on-line. Available from Google Uncle Sam. Accessed 4 October 2002.

Jaffe, Greg. "Spending for Defense (A Special Report) – New and Improved?" Wall Street Journal, 28 March 2002, p. R5. Database on-line. Available from Lexis-Nexis. Accessed 4 October 2002.

Lee, Irvin, staff officer in Joint Staff J4 Engineering Division. Telephone interview by the author, 21 February 2003.

Loeb, Vernon. "For the U.S. Military, A Transforming View of the Maginot Line." Washington Post Archives, 6 October 2002, p. B2. Database on-line. Available from Lexis-Nexis. Accessed 1 November 2002.

O'Hanlon, Michael. "Modernizing and Transforming U.S. Forces: Alternate Paths to the Force of Tomorrow." In QDR 2001 Strategy-Driven Choices for America's Security. Edited by Michele A. Flournoy. Washington, D.C.: National Defense University Press, April 2001.

Science Applications International Corporation. Engineer Capabilities Study: A Path to the Future (Final Report). McLean, VA, 30 September 2002.

Shinseki, Eric K. "The Army Vision: A Status Report." ARMY Magazine. October 2001, p1-7. Database on-line. Accessed 6 October 2002.

Shinseki, Eric K., and Thomas E. White. Army Transformation Roadmap. Washington, DC, June 2002.

Smith, Edwin P. "Integrated Warfighting: Toward a Joint Transformational Framework." Armed Forces Journal International (September 2002): 68-74.

U.S. Army Engineer School. “Objective Engineer Force Information Briefing and Guidance.” Briefing slides. Fort Leonard Wood, MO, 23 October 2002.

U.S. Department of the Army. Engineer Operations Short of War. Field Manual 5-114. Washington, D.C.: U.S. Department of the Army, 13 July 1992.

U.S. Department of the Navy. Seabee Combat Development Process. NAVFACENGCOM Instruction 5201.1. Washington, D.C.: U.S. Department of the Navy, 7 August 2000.

_____. Establishment of First Naval Construction Division(1NCD)/Naval Construction Forces Command (NCFC) and Modification of Atlantic and Pacific Naval Construction forces (NCF). OPNAVNOTE 3111. Washington, D.C.: U.S. Department of the Navy, 26 July 2002.

U.S. Joint Chiefs of Staff. Engineer Doctrine for Joint Operations. Joint Publication 3-34. Washington, D.C.: U.S. Joint Chiefs of Staff, 5 July 2000.

_____. Joint Doctrine for Barriers, Obstacles, and Minefields. Joint Publication 3-15. Washington, D.C.: U.S. Joint Chiefs of Staff, 24 February 1999.

_____. Joint Doctrine for Civil Engineering Support. Joint Publication 4-04. Washington, D.C.: U.S. Joint Chiefs of Staff, 27 September 2001.

_____. Joint Tactics, Techniques, and Procedures for Geospatial Information and Services Support to Joint Operations. Joint Publication 2-03. Washington, D.C.: U.S. Joint Chiefs of Staff, 31 March 1999.

_____. Unified Action Armed Forces (UNAAF). Joint Publication 0-2. Washington, D.C.: U.S. Joint Chiefs of Staff, 10 July 2001.

Unified Command Plan. Washington, D.C.: The White House, 30 April 2002.Woodward, John, staff officer in JFCOM J4 Engineering Division. Telephone interview by the author, 21 February 2003.